Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method for demodulation of M-ary quadrature amplitude modulation (M-QAM) signals by estimating the amplitude of a received M-QAM signal based upon known phase information of a plurality of transmitted symbols (d_k), the method comprising ~~the steps of~~:

recovering a respective set of received symbols (r_k) corresponding to the plurality of transmitted symbols (d_k);

generating a set of products based on the received symbols (r_k);

summing the set of products;

determining the real part of the sum of products;

summing the absolute values of the transmitted symbols $|(d_k)|$ to generate a magnitude value; and

generating the estimated amplitude of the received M-QAM signal by dividing the real part of the sum of products by the magnitude value.

2. (previously presented) The method of claim 1 wherein said generating the set of products ~~step~~ comprises:

multiplying each of the plurality of received symbols (r_k) by exp [$-j\theta(d_k)$], wherein $\theta(d_k)$ represents the phase of a corresponding transmitted symbol (d_k).

3. (previously presented) A method for demodulation of q-ary quadrature amplitude shift keyeing (q-ASK) signals by estimating the amplitude of a q-ASK signal at a receiver based upon magnitude information regarding a plurality of N transmitted symbols (d_k) where N is a positive integer greater than one, the method comprising ~~the steps of~~:

recovering a respective set of N received samples (y_k) corresponding to the transmitted symbols (d_k);

for each of the N samples, multiplying the sample (y_k) by a corresponding sign (d_k) to generate a set of products (y_k)*sign(d_k);

summing the set of products to generate a first sum;

summing the absolute values of the transmitted symbols $|(d_k)|$ to generate a second sum; and

generating the estimated amplitude of the q-ASK signal by dividing the first sum by the second sum.

4. (previously presented) A method for signal demodulation by estimating the amplitude of a received signal which includes a set of N transmitted symbols (d_k), where N is a positive integer greater than one, the method comprising ~~the steps of~~:

recovering a respective set of N received samples (y_k) corresponding to the transmitted symbols (d_k);

determining the absolute values of the received samples $|(y_k)|$;

summing the absolute values to generate a first sum;

determining the mean of the absolute values of the amplitudes of transmitted symbols, $E|(d_k)|$;

multiplying the mean of the absolute values by N to generate a product, $N^* E|(d_k)|$; and

generating the estimated amplitude of the received signal by dividing the first sum by the product.

5. (previously presented) The method of claim 4, wherein the received signal is an M-ary quadrature amplitude modulation (M-QAM) signal.

6. (previously presented) The method of claim 4, wherein the received signal is a q-ary amplitude shift keyeing (q-ASK) signal.

7. (previously presented) A method for demodulation of M-ary quadrature amplitude modulation (M-QAM) signals by estimating the amplitude of a received M-QAM signal that includes a set of transmitted symbols (d_k), the method comprising ~~the steps of~~:

recovering a respective set of received samples (r_k) corresponding to the transmitted symbols (d_k);

determining the mean of the absolute values of the amplitudes of the transmitted symbols, $E|(d_k)|$;

determining the mean of the absolute values of the amplitudes of the received samples, $E|(r_k)|$; and

estimating the amplitude of the received M-QAM signal $\hat{A}$ as: $\hat{A} = \{ [2*(E|r_k|^2)^2 - E|r_k|^4] / [2*(E|d_k|^2)^2 - E|d_k|^4]\}^{1/4}$.

8. (previously presented) A method for demodulation of M-ary quadrature amplitude modulation (M-QAM) signals by estimating the noise power of a received M-QAM signal that includes a set of transmitted symbols (d_k), the method comprising ~~the steps of:~~

recovering a respective set of received samples (r_k) corresponding to the transmitted symbols (d_k);

determining the mean of the absolute values of the amplitudes of the transmitted symbols, $E|(d_k)|$;

determining the mean of the absolute values of the amplitudes of the received samples, $E|(r_k)|$;

estimating amplitude of the received M-QAM signal $\hat{A}$ as: $\hat{A} = \{ [2*(E|r_k|^2)^2 - E|r_k|^4] / [2*(E|d_k|^2)^2 - E|d_k|^4]\}^{1/4}$; and

estimating noise power of the received M-QAM signal σ^2_n as: $\sigma^2_n = E|r_k|^2 - \hat{A}^2 E|d_k|^2$.

recovering a respective set of received samples (r_k) corresponding to the transmitted symbols (d_k);

determining second and fourth order moments of the transmitted symbols, $E(d_k^2)$ and $E(d_k^4)$;

determining second and fourth order moments of the received samples, $E(r_k^2)$ and $E(r_k^4)$; and

estimating amplitude of the received q-ASK signal Â as: $\hat{A} = \{ [3*(E(r_k^2))^2 - E(r_k^4)] / [3*(E(d_k^2))^2 - E(d_k^4)]\}^{1/4}$.

11. (previously presented) A method for demodulation of q-ary amplitude shift keyeing (q-ASK) signals by estimating the power of a received q-ASK signal that includes a set of transmitted symbols (d_k), the method comprising ~~including the steps of:~~

recovering a respective set of received samples (r_k) corresponding to the transmitted symbols (d_k);

determining second and fourth order moments of the transmitted symbols, $E(d_k^2)$ and $E(d_k^4)$;

determining second and fourth order moments of the received samples, $E(r_k^2)$ and $E(r_k^4)$; and

estimating power of the received q-ASK signal as: $\hat{A}^2 = \{ [3*(E(r_k^2))^2 - E(r_k^4)] / [3*(E(d_k^2))^2 - E(d_k^4)]\}^{1/2}$.

9. (previously presented) A method for demodulation of M-ary quadrature amplitude modulation (M-QAM) signals by estimating the signal-to-noise ratio (SNR) of a received M-QAM signal that includes a set of transmitted symbols (d_k), the method comprising ~~the steps of~~:

recovering a respective set of received samples (r_k) corresponding to the transmitted symbols (d_k);

determining the mean of the absolute values of the amplitudes of the transmitted symbols, $E|(d_k)|$;

determining the mean of the absolute values of the amplitudes of the received samples, $E|(r_k)|$;

estimating amplitude of the received M-QAM signal $\hat{A}$ as: $\hat{A} = \{ [2^*(E|r_k|^2)^2 - E|r_k|^4] / [2^*(E|d_k|^2)^2 - E|d_k|^4]\}^{1/4}$;

estimating noise power of the received M-QAM signal σ^2_n as: $\sigma^2_n = E|r_k|^2 - \hat{A}^2 E|d_k|^2$; and

estimating SNR of the received M-QAM signal as: $SNR = [\hat{A}^2 * E|d_k|^2] / \sigma^2_n$.

10. (previously presented) A method for demodulation of q-ary amplitude shift keyeing (q-ASK) signals by estimating the amplitude of a received q-ASK signal that includes a set of transmitted symbols (d_k), the method comprising ~~including the steps of~~:

12. (previously presented) A method for demodulation of q-ary amplitude shift keyeing (q-ASK) signals by estimating the noise power of a received q-ASK signal that includes a set of transmitted symbols (d_k), the method comprising ~~including the steps of~~:

recovering a respective set of received samples (r_k) corresponding to the transmitted symbols (d_k);

determining second and fourth order moments of the transmitted symbols, $E(d_k^2)$ and $E(d_k^4)$;

determining second and fourth order moments of the received samples, $E(r_k^2)$ and $E(r_k^4)$;

estimating amplitude $\hat{A}$ as: $\hat{A} = \{ [3*(E(r_k^2))^2 - E(r_k^4)] / [3*(E(d_k^2))^2 - E(d_k^4)]\}^{1/4}$; and

estimating noise power of the received q-ASK signal σ^2_n from the estimated amplitude $\hat{A}$ as: $\sigma^2_n = E(r_k^2) - \hat{A}^2 E(d_k^2)$.

13. (previously presented) A method for demodulation of q-ary amplitude shift keyeing (q-ASK) signals by estimating the signal-to-noise ratio (SNR) of a received q-ASK signal that includes a set of transmitted symbols (d_k), the method comprising ~~including the steps of~~:

recovering a respective set of received samples (r_k) corresponding to the transmitted symbols (d_k);

determining second and fourth order moments of the transmitted symbols, $E(d_k^2)$ and $E(d_k^4)$;

determining second and fourth order moments of the received samples, $E(r_k^2)$ and $E(r_k^4)$;

estimating amplitude $\hat{A}$ as: $\hat{A} = \{ [3*(E(r_k^2))^2 - E(r_k^4)] / [3*(E(d_k^2))^2 - E(d_k^4)]\}^{1/4}$;
estimating noise power σ^2_n as: $\sigma^2_n = E(r_k^2) - \hat{A}^2 E(d_k^2)$; and

estimating SNR of the q-ASK signal as: $SNR = [\hat{A}^2 * E(d_k^2)] / \sigma^2_n$.

14. (previously presented) A method for demodulation of M-ary quadrature amplitude modulation (M-QAM) and q-ary amplitude shift keyeing (q-ASK) signals by estimating the signal-to-noise ratio (SNR) of a received M-QAM or q-ASK signal from second-order and fourth-order moments of received samples (r_k), wherein the second-order moment is defined as $E\{|r_k|^2\} = E\{|n_k|^2\} + E\{|d_k|^2\}$, and the fourth-order moment is defined as $E\{|r_k|^4\} = E\{|n_k|^4\} + E\{|d_k|^4\} + 4E\{|n_k|^2\}E\{|d_k|^2\}$, where d_k denotes the transmitted symbols and n_k denotes a noise component that is recovered with the received samples r_k; the method comprising ~~the steps of:~~

dividing the fourth-order moment by the second-order moment so as to implement a Kurtosis operation as:

$$Kurt(r) \equiv \frac{E\{|r_k|^4\}}{E\{|r_k|^2\}^2} = \frac{E\{|d_k|^4\} + E\{|n_k|^4\} + 4E\{|d_k|^2\}E\{|n_k|^2\}}{E\{|d_k|^2\}^2 + E\{|n_k|^2\}^2 + 2E\{|d_k|^2\}E\{|n_k|^2\}},$$

wherein the foregoing expression for Kurtosis includes a first Kurtosis component attributable to received signal, and a second Kurtosis component corresponding to received noise;

determining the first Kurtosis component attributable to the signal alone, (K_{sig}), as: $K_{sig} \equiv \frac{E\{|d_k|^4\}}{E\{|d_k|^2\}^2}$; and

estimating the signal-to-noise ratio (SNR) of the received M-QAM or q-ASK signal as:

$$SNR = \frac{(2 - Kurt(r)) + \sqrt{(4 - 2K_{sig}) - (2 - K_{sig})Kurt(r)}}{(Kurt(r) - K_{sig})}.$$